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Regional Ownership Costs and Marginal Effective Tax Burden for Rural Capital

Case Study of the Farm Sector

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Abstract

This report presents estimates of the effective tax burden placed on the lifetime income stream from a marginal addition to regional farm sector capital portfolios, and the ownership costs of these capital additions. Estimates are based on a framework that uses Jorgenson's method of measuring the cost of capital, and data requirements are largely met using official U.S. Government statistics and State and Federal statutory tax rules. Results vary widely across farm production regions due to Federal and State income and wealth tax systems. This disparity systematically changes with alternative assumptions regarding inflationary expectations and the rate of return from employing capital in production. The tax system, inflationary expectations, and the expected rate of return to capital-all of which are influenced by fiscal and monetary policies- affect the relative tax burden and expected lifetime net income from new investments in productive capital across farm production regions.

Keywords: cost of capital, farm capital, farm production regions, fiscal policy, inflation, marginal effective tax rate, monetary policy, rural economy, tax rules

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Contents

Summary

This report examines the impact of macroeconomic policies in rural capital markets through a case study of the U.S. farm sector. A fixed-factor model of regional capital markets is developed, and the economic incidence of State and Federal tax policy, inflation, and the equilibrium real rate of return to capital are examined. The basis for comparisons are empirical measures of ownership costs and lifetime tax burdens in regional capital markets.

A numerical model of farm sector business capital is developed and calibrated to 1992 State-level data. Ownership of capital is stratified into 2,688 alternative classifications, or basic taxable portfolio's (BTP). These strata include 48 States, 2 sectors (metro/nonmetro), 7 asset types (3 building types and 4 machinery types), 2 organizational structures (corporate/noncorporate), and 2 acquisition methods (debt/equity purchases). With this level of detail, a wide range of differential treatment in the U.S. tax system can be captured. We can then aggregate up to more familiar units of measurement and compare economic conditions across different capital markets.

The theoretical foundations of the numerical model are based on the cost-of-capital concepts introduced by Jorgenson. The concept of the marginal effective tax rate and the ownership cost of capital has grown out of the literature concerning comparative tax systems. The methods used in this report are based on several recent studies comparing the tax incidence on income from capital across several countries, or across several sectors of a single country. Our contribution is the application of this methodology across several production regions of a single country, and with extensive detail within a single industry.

The data required as input to the numerical model are derived largely from primary sources, and to a large extent are based on tax year 1992. The primary sources are the 1992 U.S. Census of Agriculture, the U.S. Department of Treasury, Statistics of Income, the USDA Farm Costs and Returns Survey, and 1992 State and Federal tax codes. Several imputation procedures were required to provide detail beyond that of the primary sources. Where this was necessary, procedures were applied similar to those used in existing published research. Empirical results were validated by a sensitivity analysis, which shows that large random fluctuations in the value of capital stock data have a proportionally small effect on estimates.

The general findings of this study are, (1) a wide disparity of tax incidence exists across asset types, ownership categories, and production regions; (2) higher (lower) than expected inflation increases (decreases) the anticipated excess burden of taxes on the income from capital; (3) the impact in capital markets from changes in inflation expectations is not uniform, and can increase the disparity of tax incidence across asset types and production regions; (4) increasing (decreasing) the assumed real rate of return that investments in capital must achieve in order to compete for a limited flow of investment funds decreases (increases) the tax incidence on income from capital; and (5) the impact in capital markets from changes in the required real rate of return for capital is not uniform, and can increase the disparity of tax incidence across asset types and production regions.

These general findings lead to interesting policy implications. Differences in tax burden distort private investment incentives, which leads to suboptimal allocation of investment capital. Nonuniform effects across production regions from revised inflation expectations lead to changes in the regional disparity of tax incidence, which can be a catalyst for structural change in regional capital markets. While increasing the required rate of return to capital diminishes the tax incidence, some regions benefit more than others.

Regional Ownership Costs and Marginal Effective Tax Burdens for Rural Capital:

A Case Study of the Farm Sector

Patrick Canning and Douglas Rhoades

Introduction

The economic conditions for the employment of capital in production is a leading indicator of the profit, investment, and growth prospects of any business that employs capital. But these economic conditions are regional, and each region can go through distinct economic trends[1] in capital markets due to their unique interaction of tax rules, inflationary pressures, financial conditions, and technology adoption. Even within regions, economic trends are not uniform, but affect firms and industries according to their asset portfolios and the State in which the asset is owned. This report examines causes leading to distinct economic conditions for different capital portfolios, and provides regional estimates of factors affecting the employment conditions for capital in the predominantly rural U.S. farm industry.

The focal point of this examination is the treatment of income and capital ownership in Federal and State tax codes. Taxation of income and wealth drives a wedge between the social return (the value of economic output) and the net private return to employers of capital (how much owners/employers can keep). The size of this tax wedge and changes in size over time is unique to each capital portfolio owner. This is an unintended consequence of a tax system that strives to be efficient (e.g., neutral), equitable (e.g., progressive), and simple. The primary cause of non-neutrality in the tax code is prohibitive information requirements for developing an accurate account of replacement costs incurred by factor owners of business capital, and for monitoring compliance with such a system. Instead, a finite set of rules have been developed to approximate these costs, and the accuracy of these proxies varies across portfolios.

To determine the extent to which this tax wedge varies across capital markets, we have identified 2,688 basic taxable portfolios (BTP) in the U.S. farm industry and have estimated the share of total annual replacement investment in each BTP. For these BTP's, we compute two economic measures, the ownership cost and the marginal effective tax rate. These measures capture conditions in local capital markets and, with our capital stock share data, allow us to aggregate to several levels of detail.

Ownership cost is the net expense to owners or employers of a standardized unit of capital, in any form. It is calculated by subtracting from the \$1-per-unit purchase price the total net present value of all investment tax reductions afforded to each unit, including tax deductions, depreciation allowance, and investment subsidies available over the government-determined tax life of the asset. The marginal effective tax rate (METR) represents the share of income from a unit of new capital that must be paid in

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[1]Our use of the term 'trend' refers to the empirical evidence on the change in levels of important economic indicators in the rural economy, relative to aggregate national levels or levels in the urban economy.

taxes. It is not the same as the statutory rate of taxation written into the tax code, but instead measures the actual incidence of these statutory tax rules after netting out all tax reductions. The METR directly affects the profits and portfolios of capital owners. As we shall demonstrate in our case study, some capital owners bear larger cost and tax burdens than others, and these burdens follow systematic and predictable patterns.

Inflation has two important roles in our empirical account of conditions in capital markets. In determining the expected stream of future income from using capital in production, inflationary expectations are used to account for anticipated increases in the price received from capital-derived outputs. Also, in considering the relative value of alternative investment decisions (e.g., debt verses equity financing, future depreciation allowances), inflation is important for measuring the purchasing power of income from capital investments, both in terms of consumption goods and for replacement of obsolete capital in production. In our model, all of the measures of expected inflation are determined using a procedure that assumes a precise relationship between investor inflation expectations and the implicit price deflator of the annual U.S. gross domestic product. This procedure implies that expectations about inflation in these different markets are formed by all agents in the economy using the same information, and that the tendency is for inflation expectations to be the same for all relevant prices (e.g., prices paid for all inputs and prices received for all outputs).

This report draws most from work on taxation of income from capital (Gravelle, 1994), particularly empirical work on international comparisons of the marginal effective tax rate on income from capital (King and Fullerton, 1984; Jorgenson and Landau, 1993; Boadway, Bruce, and Mintz, 1984). Our contribution is the application of this comparative framework to U.S. rural capital markets. We focus on regional rural capital portfolios through a multiregional comparison of ownership cost and tax burden in the farm sector.

Background

Although the rural economy is not defined by an economic delineation,[2] it has exhibited a distinct economic trend relative to the national economy (USDA, 1995b). In the 1970's, for example, a long steady expansion in rural industry outpaced urban industry, while the 1980's witnessed a disproportionate reversal to a largely stagnant rural economy. So far in the 1990's, a slow and steady recovery of the rural economy has outpaced the national trend. Rural population has followed a similar trend. Rural wages have remained significantly lower than the national average for comparable jobs, and rural industry employs a disproportionately low share of highly skilled labor. There has been a steady outmigration of skilled labor over an extended period from rural communities into urban industries (USDA, 1991).

We examine why rural industry exhibits a distinct economic trend with an analysis of economic conditions for the use of capital by industry in rural America. Specifically, we demonstrate the possibility of economic trends being driven by fluctuating economic conditions in capital markets, and measure the extent that changes in inflation expectations, tax rules, and rates of return on capital cause

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[2]Using a county delineation, rural America is defined as all U.S. counties that fail to meet two criteria: that they (1) contain or have strong ties to one or more cities or urbanized area of at least 50,000 residents, and (2) have a total metropolitan population of at least 100,000.

nonuniform fluctuations in regional capital market conditions. It is important to demonstrate that relative conditions in capital markets can exhibit distinct trends, depending on identifiable and measurable characteristics of distinct capital portfolios. Also important is compelling evidence that a rural/urban partition of U.S. capital stock will exhibit distinct portfolio characteristics conducive to producing distinct economic conditions for use of capital in rural and urban industries.

Rural America is home for around one-fifth of the Nation's population and workforce, and includes around four-fifths of the land (USDA, 1995a). Services, government, and manufacturing employ 85 percent of the rural workforce; farming, construction, and mining employ another 14 percent (USDA, 1995a). Technology, once a prohibitive barrier to rural economic development, has become increasingly homogeneous in rural and urban sectors, particularly in communications and transportation (USDA,1995b).

Several characteristics of rural industry can lead to a distinct partition of rural and urban capital portfolios. Barriers to technology adoption in remote rural areas (Munnell, 1990), scale economies in labor markets and in the adoption of new technologies (Kalder, 1990), and the superior ability of urban industry to attract and retain large quantities of skilled labor (USDA, 1991) all affect industry location decisions. Knowledge about these asymmetries contributes to our understanding of issues such as the labor and productivity gap between rural and urban industry, the level and type of economic activity in the two regions, and different policy instruments conducive to rural economic development. It is also helpful to our understanding of capital flows between rural and urban industry. For example, when rural employment and rural population show gains relative to the urban economy, it is difficult to make a case that this trend was preceded by a reversal in the impact of agglomeration effects in urban industry or in the preferred destination of skilled labor from urban to rural industry. While removing the barriers to technology adoption in rural industry is a promising explanation for surges in rural economic activity, it seems less plausible that subsequent downturns in the rural economy are caused by new technology barriers. We can demonstrate that factors affecting the use of capital by rural industries can exhibit trends distinct from those in urban industry. Whether this is in fact the case is an empirical matter.

The Model

When Federal and State governments collect income taxes each year, owners of business capital are permitted to deduct the cost of depreciated capital (z) from their taxable income base. This deduction translates into a tax reduction of $\tau \times z$ dollars, where τ is the marginal income tax rate the proprietor would have to pay on income of z if it were not deducted. There are several methods for proprietors to calculate depreciation, depending on the type of asset, but it is always based on the purchase price (not the replacement cost) of the asset. For example, the straight-line method allows the owner to deduct the full purchase price over a specified period of time, with equal deductions each year. If government specifies a 10-year cost recovery period, the owner deducts 10 percent of the original purchase price each year. A unit of capital, by our definition, has a purchase price of $1, so the proprietor will be allowed a $0.10 annual deduction for the next 10 years. The total value of this deduction will be $\$0.1 \times \tau$ each year (in the form of tax burden reductions). But the depreciation allowance in future years (2 - 10) must be discounted to convert this benefit stream into its current value to the investor. If we assume this discount rate, denoted as ρ, and the statutory income tax rate remain constant over the tax life of the asset, we know that the present value (see Silberberg, 1990) of the total depreciation allowance, denoted A_z, is equal to $z \times [1-e^{-\rho T}] \div \rho$, where T is the government-set cost recovery period (10 in our example) and $z=1/T$.

Many purchases of business capital are allowed to be fully deducted against business receipts when reporting taxable income. For example, a proprietor may be allowed to depreciate some percentage, β_1, of new capital purchases over T years, and can immediately expense the remainder, β_2, against current-year income ($\beta_2=1-\beta_1$). Further, in some special cases, Federal and/or State governments provide business assistance toward the purchase of new capital by sharing some percentage, β_3, of the cost of purchasing each unit of capital. The total value of these tax reductions is equal to:

$$A = \beta_1 A_z + \beta_2\tau + \beta_3, \tag{1}$$

per unit of capital. By definition, each unit of capital sells for \$1, so factoring in the owner's tax reductions, the ownership cost of capital is equal to:

$$C = 1 - A = 1 - (\beta_1 A_z + \beta_2\tau + \beta_3). \tag{2}$$

Each unit of capital generates income to the business and tax revenue to Federal and State budgets. Like business owners, society would also like to employ each of its resources to the point where social costs and social benefits are equal. But with regard to capital, the extent of its use is decided by employers of capital, most of whom are private agents interested in maximizing their net worth. The existence of a wedge-- driven between private and social returns to capital by the tax system-- has adverse economic consequences (Gravelle, 1994). Different effective rates of taxation on capital has adverse distributional consequences across capital markets. These distributional consequences of the overall tax system are measured by empirical estimates of the marginal effective tax rate. When aggregated to levels such as production regions and economic sectors, the METR becomes a valuable source of information for understanding the relative performance of different economic areas.

The METR measures the percentage of the social return from a unit of capital that is taxed away from the employer of this capital, accounting for the tax reductions (A) afforded these employers. The private return from capital (p) is equal to the social return (s), net of its marginal effective tax, $p=(1-METR)\times s$. Rearranging this expression gives us the definition of the marginal effective tax rate;

$$METR = (s-p)/s. \tag{3}$$

To measure this, we must recognize that productive capital inputs have service lives that extend beyond a single period (e.g., years). A unit of capital generates an amount, R, of gross rental income each period, but will have depreciated in productive value by an amount δ, where δ is the annual exponential rate of depreciation (depicted here as constant over time). The annual income that society realizes from this unit of capital after 1 year is:

$$s = R - \delta. \tag{4}$$

Rearranging equation 4, $R=s+\delta$, which shows that revenue earned from capital is composed of net capital income and maintenance income required to replace the lost productive capital.

We have shown above that Federal and State governments provide an incentive valued at *\$A* for each unit of capital employed, and thus the ownership cost of capital is *1-A* per unit. While each employer of capital will realize a pre-tax revenue of R, this revenue is subject to a combined Federal and State income tax at a rate, τ, and a per-unit wealth tax of w^b (which accounts for the deduction of this tax from

taxable income). In the initial year of use, capital will generate a net cash flow of $s+\delta-\tau R-w^b$ per unit (the social return plus maintenance income minus the private tax burden). This does not reflect depreciation and deduction allowances, which are treated separately in our account of ownership costs. If we assume that each subsequent year this net cash flow will grow at the exponential rate of inflation (e^{π}), while the cost of maintaining this capital will increase at the exponential rate of capital decay in this cash flow ($e^{-\delta}$), than the present value of total net cash flow over the productive life of the asset is[3]:

$$V = [(1-\tau)(s+\delta)-w^b]/(\rho+\delta-\pi) = [(1-\tau)(R)-w^b]/(\rho+\delta-\pi). \tag{5}$$

When capital markets are in equilibrium, the last unit of purchased capital will be expected to generate a stream of income over its productive life that has a net present worth equal to the ownership cost. So by assuming a capital market equilibrium, we know the following identity must hold:

$$V = [(1-\tau)(s+\delta)-w^b]/(\rho+\delta-\pi) = 1-A = C, \tag{6}$$

which simply restates that the stream of net benefits are equal to ownership costs. This must hold for any new investment in business capital. By rearranging equation 6 to isolate the expression s on one side of the equality, we are able to compute the expected social rate of return:

$$s = (1-\tau)^{-1}\times[(\mathit{1-A})\times(\rho+\delta-\pi)+w^b] - \delta. \tag{7}$$

To calculate the METR, we must also derive an expression for p. To do this, we use our assumption that capital markets are in equilibrium, and note that all private investment is, by definition, financed through household savings, either directly or through financial intermediaries. The opportunity cost for household financing of a specific investment is the competitive nominal market rate of return from issuing debt for financing an alternative new investment, net of personal income and wealth taxes. At the margin where investment financing would cease, the private return and opportunity cost of an investment, net of inflation, will be equal:

$$p = (1-m)*i - \pi - w^p, \tag{8}$$

where m is the marginal statutory income tax rate on interest income from household investments, i is the expected nominal rate of return on the investment, and w^p is the statutory tax rate on personal wealth. We assume that the interest rates adjust 1-for-1 with the expected rate of general price inflation (Fisher,1930), such that i and π differ by a constant r:

$$i = r + \pi, \tag{9}$$

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[3]An income stream that grows at a continuous rate of π and decays at a continuous rate of δ, when discounted at a continuous rate of ρ, is measured using integral calculus (Silberberg, 1990) as:

$$\int_0^{\infty}[(1-\tau)R-w^b]e^{-(\rho+\delta-\pi)t}dt = [(1-\tau)(s+\delta)-w^b]/(\rho+\delta-\pi).$$

where r represents the real pre-tax rate of return from household savings.[4] If tax rates were all set to 0, r and p would be equal. Otherwise, for a given r, p will vary across investors according to the statutory marginal income and wealth tax rates.

If we could obtain all of the information needed to specify values for the expressions on the right side of the equalities in equations 7 and 8, our work would be complete. But estimates for the private discount rate of future income (ρ) and the competitive rate of return on new investments (i) are not easily obtained. These values can be subjective and may differ with each asset portfolio. We are left with two equations (7 and 8) and four unknowns (s, p, i, ρ). Under these conditions, no unique solution can be obtained. Our remedy is to first expand our definition for ρ. Choosing a value for individual time preference of income, or the discount rate, has proven to be a controversial issue (Lind, 1990). We define ρ for two different scenarios--debt-financed investments and equity-financed investments. For debt, it is the opportunity cost of borrowed funds, or the interest rate for borrowing (i), net of tax deductions on interest payments:

$$\rho = i * (1-\tau). \tag{10}$$

For equity-financed investments (retained earnings if corporate ownership), we use:

$$\rho = i * (1-m)/(1-k), \tag{11}$$

where k is the effective rate of taxation on capital gains.[5] For corporations, this reflects the investors' tradeoff between receiving interest payments from issuing debt on a competitive alternative investment with a net of tax return equal to (1-m)*i, and increasing the value of corporate stock, which is subject to taxation at a deferment-adjusted rate for capital gains, (1-z)*ρ.[6] Since i and ρ now have an exact relationship, we have reduced our unknowns to three.

Our final step is to fix one of the three remaining unknowns and solve. This step takes one of two paths. One path, the fixed-s assumption, is to exogenously specify a value for s (e.g., s=0.1) and solve equation 7 for ρ. Since s is a nonlinear monotonic function of ρ, if there is a solution, it is unique but must be obtained through an iterative process. By obtaining a value for ρ, we are able to determine the value of *A*

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[4]In our empirical models, r is either determined residually or exogenously set. While the results may reflect such factors as risk-adjusted and/or weighted average rates from a combination of alternative investments, we do not consider these distinctions.

[5]Retained earnings in this context increase the value of capital holdings, but the seven asset categories we consider are a negligible source of realized capital gains to factor owners, so we assume k=0.

[6]We do not consider corporate financing of investment through new share issues.

(A is a function of ρ).[7] From equation 10 or 11, we obtain i and plug the subsequent solutions for s and p into equation 3, which gives us the METR. In the process we have calculated A and so can also measure the ownership cost of capital. This provides a gauge on how far away the current system is from the Golden Rule of capital income taxation. This rule requires that any tax on capital should be such that the social rate of return (s) is equal across all units of productive capital. Intuitively, if this does not hold, society would be better served by employing more units of the capital earning a higher rate of return, in place of capital earning lower rates of return. The difference in the size of basic tax portfolio (BTP) tax wedges when we impose an identical s for all assets shows us the strength of the incentive created by the tax system to move away from the fixed-s equilibrium. The solution for r is the implicit rate of indifference between lending at this rate in a competitive alternative investment and investing in the BTP with a pre-tax return of s. This equilibrium is not stable since the required real rate of return (r) that achieves indifference will not be uniform, so there is an incentive to adjust portfolio holdings.

Our second approach, the fixed-r assumption, is more straightforward. We first specify a market-clearing real pre-tax rate of return common to all investments (e.g., r=0.4). With our assumption regarding inflation (π), we can solve equation 9 for i, which we plug into equation 10 or 11 to derive ρ. The remainder of the procedure is the same as for the fixed-s, and this solution represents a stable equilibrium, since all investment opportunities face the same pre-tax rate of return. For this scenario, the solution for s represents the marginal pre-tax return required by an investor in a specific BTP if the equilibrium real pre-tax rate of return on alternative investments (r) is the exogenously specified rate.

In both approaches, s represents the minimum rate of return, before taxes, that a 'company' must pay savers to lure them away from a net of tax return on lending at the market rate, i. The value for p is related to s and i by the specific tax rules that apply to the perspective investor in the company. The value of r represents the real rate of interest received from the financial claim a private saver has on a company. Our BTP's represent alternative patterns of capital ownership as follows: organizations are either corporate or noncorporate; location is either metro or nonmetro; region of ownership includes 48

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[7]Calculating A_z is somewhat complicated. Most forms of farm capital are allowed 150 percent of the straight-line depreciation of a declining balance with a switch to straight-line depreciation at the most advantageous period for the taxpayer (rental dwellings are required to be depreciated on a straight-line basis). A midyear purchase assumption rule (midmonth for some buildings, and first or third quarter for other assets) allows only partial depreciation in the year of purchase and the final year of depreciation. Optimal switch to straight-line depreciation is at one-third of the asset's tax life (rounded to the nearest half-year interval). Total value of the depreciation allowance over the asset's tax life is:

$$A_z = [1.5/L * \sum_{t=0}^{.5} (1+\rho)^{-t} + (1.5/L - 1.5^2/2L^2) * \sum_{j=0}^{L/3\,-\,1.5} [(L-1.5)/L]^j * \sum_{k=j+.5}^{j+1.5} (1+\rho)^k$$

$$+ [(L-.75)/L] * [(L-1.5)/L]^{L/3\,-\,.5} * (3/2L) * \sum_{i=L/3}^{L} (1+\rho)^i] \times \tau \ ,$$

where L is the asset's tax life. This is the discrete time version of equation 6.5 in King and Fullerton (1984).

States located within 1 of 10 farm production regions (fig. 1); financing is either through debt or equity; and type of capital includes 3 building types and 4 machinery and equipment types (see discussion below). This allows 2,688 alternative investment opportunities in farm capital for which we compute the ownership costs and the METR. We aggregate these individual estimates to several levels, all within farm production regions, using the identity:

$$\text{METR} \equiv [\textstyle\sum \alpha_k(s_k\text{-}p_k)] \div \sum \alpha_k s_k, \tag{14}$$

where k is one of the 2,688 BTP, and α is a weighting parameter equal to the value for capital stock of portfolio k divided by total capital stock value in the specified aggregation.

A Numerical Example

Following is a numerical example using first a proprietor then a small corporation, both operating in the same geographic region. Based on the 1992 tax year, the proprietor employs $100,000 worth of capital, and earns an annual taxable income of $50,000. The Federal marginal tax rate for this income bracket is 15 percent. This proprietor's State has a 7-percent marginal income tax in this income bracket, but State income taxes are deductible on Federal returns (we assume this State does not allow the deduction of Federal taxes on State returns), so the combined Federal/State marginal income tax rate is τ=.15+(1-.15)×.07≈.21. There is no State property tax, so w^b=0. Assume that for all capital employed there is a constant exponential rate of decay, δ=.25, and that expected inflation is π=.037, which is the average U.S. economywide inflation rate over the 12 quarters prior to the first quarter of 1992. The Government allows for a 7-year cost recovery period using the straight-line method for all capital employed by the proprietor, deductions are not allowed (β_2=0), and there is not a cost-sharing subsidy (β_3=0). Plugging these values, plus the value s=0.1, into equation 7, we invoke our computer algorithm to determine the value for ρ (see appendix table 3), which we determine to be 0.11. We assume the proprietor finances new capital purchases entirely with debt financing, and thus determine a value for i = 0.14, based on equation 10. Since we are dealing with an individual, the marginal tax rate on interest income is the same as for capital income (τ=m), and so our estimated value for the private rate of return of this proprietor is 7.4 percent, and the METR is (0.1-0.074)/0.1=0.26. This is the share of capital income, net of depreciation (R-δ), that the proprietor would pay on income from the purchase of an additional unit of the same type of capital currently held, accounting for all tax deduction allowances. The ownership cost is *1-A*=$0.85. This amount represents the true opportunity cost for the next unit purchase of business capital of the type described above.

The second example is of a corporation holding $100,000 of capital with the same service life and cost recovery period as the proprietor's capital, as well as $100,000 in capital stock with a .02 exponential rate of decay and a 25-year tax life. This corporation earns an annual adjusted gross income of $100,000, and faces marginal tax rates of 15 percent at the Federal level and 3 percent at the State level, thus METR=.15+(1-.15)×.03≈.18. This corporation also faces no wealth tax, and has the same expectations as the proprietor regarding inflation. The METR for the capital of like service life is 0.22, while the METR for the long-lived asset is 0.16. Ownership cost for these assets are $0.88 and $0.94.

These METR estimates are useful for comparing the tax burden on different forms of capital and different ownership patterns. But levels of data aggregation provide for a more useful analyses. For our three estimates, we will compute two aggregate measures. First, we combine the two corporate measures

into one measure of corporate tax burden. Next, we combine all three measures to derive an overall METR for this area, which could be compared with a similar aggregation in other areas.

To aggregate, we need a basis to assign weights to each BTP. Since we assume the economy to be in equilibrium, and we have measures of the capital stock in each BTP, we can assign weights to each METR estimate based on this information, particularly when we impose identical social rates of return to all capital. For corporate capital, total capital stock is worth \$200,000 and each BTP has half of total corporate capital stock, so both BTP are assigned a weight of 0.5, and the overall corporate capital METR is $0.5\times0.22 + 0.5\times0.16 = 0.19$. For all capital in this 3-BTP region, capital stock of \$300,000 is evenly divided between BTP, so the regional METR is $0.333\times0.26 + 0.333\times0.22 + 0.333\times0.16 = 0.213$.

In our case study, we disaggregate total U.S. farm capital into 2,688 BTP and compute estimates for ownership costs (1-A) and METR for each. Tables 1 to 6 present these estimates for several different levels of aggregation, and under several alternative scenario's and assumptions. Appendix tables report intermediate data used to calculate the ownership cost and METR.

Data Requirements and Sources

The 1992 Census of Agriculture (COA) farm capital stock data broken down into metro/nonmetro sectors is our basic source for capital stock data. Tax treatment of farm structures requires distinguishing rental dwellings, single-purpose structures, and multipurpose structures. The 1992 COA data on real estate value do not distinguish between the value of land and buildings. However, Canning and Leathers (1993) have developed a procedure to impute building value from COA data, and USDA employs a model based on this procedure (Canning, 1992). Published USDA State data for the 1993 stock value of buildings represent the building share of real estate value reported in the 1992 COA. Other analysis at USDA indicates that the relative value of dwellings and service structures has remained stable over time (USDA, 1994), and a government report (U.S. Department of Commerce, 1990) includes State-level data on the ratio of rental dwelling value to building value. Further, USDA produces State-level estimates of owner-occupied dwelling value as a percentage of total building value (USDA, 1994a). These two data points are used for each State to impute rental dwelling values. The residual value, after netting out owner-occupied housing, represents service-structure value. The final step is to allocate this residual value between single-purpose and multipurpose structures. We adopted a procedure that allocates two-thirds of service-structure values in each BTP as single-purpose structures, which are tax-preferred.

To allocate building values across strata, the COA published total value of rural farmland was allocated between corporate[8] and noncorporate ownership based on the percentage of rural acreage in each category. Total corporate real estate value in each State is published in the COA, and the difference between this value and rural corporate real estate value is the value of metro corporate real estate. From COA total metro real estate value data, we deduct corporate metro real estate to get noncorporate metro real estate.[9]

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[8]Our definition of corporate farms includes only other-than-family-held corporations.

[9]Corporate farms hold a 25-percent smaller share than noncorporate farms of their real estate value in the form of buildings (U.S. Dept. of Commerce, 1990). We incorporate this result.

For machinery, we use a procedure similar to that used for buildings to allocate value across strata. We must allocate total machine value between autos, trucks, tractors, and other machinery. The most comprehensive data on the relative magnitude of machine stock values come from USDA data on each of these four machinery assets, which are used for USDA farm productivity index accounts (Ball, Bureau, and Somwaru, 1995). The most recent data are for year-end value in tax year 1991. We allocate our COA data on machinery stock value based on the same distribution as in the USDA data. The 1991 data are national aggregate values, and we employ the same technique to allocate these values to the States as was employed for the productivity accounts. For both machines and buildings, we allocate the stock value for each BTP between debt and equity based on USDA-published State-level data of debt to asset ratios in 1992 (USDA, 1994).

Marginal tax rates on income from corporate nonfamily farms are calculated by first establishing brackets for total U.S. business receipts. Nine brackets, ranging from corporations with receipts under $25,000 to those with receipts of greater than $5,000,000, are used. The mean income for each bracket is calculated by dividing the total income subject to taxation in each bracket by the number of corporate tax returns (U.S. Dept. of Treasury, 1995a) in each bracket. For each State's total income by bracket, the number of corporate farms within each bracket, as reported in the COA, is multiplied by the appropriate bracket mean. State and Federal tax rates are then calculated for each of the bracket means with adjustments for deductions of State tax on Federal and, where applicable, Federal deductions on State. Marginal State corporate tax rates are the sum of each bracket tax rate weighted by the proportion of each bracket's business receipts to the total for the State.

To determine each State's marginal tax rate on noncorporate income, we used data from the 1992 Farm Costs and Returns Survey (FCRS). Household adjusted gross income (AGI) data were stratified into seven household income categories, and total value of vehicles, machinery, and buildings employed within each category was determined. Taxable income was determined by applying State-level ratios of taxable income to AGI in each of the seven income categories (U.S. Dept. of Treasury, 1995b). Federal and State marginal tax rates applying to each category were determined, and a single weighted-average statutory tax rate, based on the value of capital employed, was determined for each State. For Delaware, Nevada, and Rhode Island, because of insufficient FCRS data, we used the same procedure as for corporate capital. We calculated State marginal tax rates on interest income earned by individuals using the same methods employed for corporate income. Brackets are the same as for individual taxes, and data are from the SOI Bulletin (U.S. Dept. of Treasury, 1995b).

The first $10,000 of annual capital expenditures (for 1992) on tangible and depreciable personal property (including single-purpose structures and livestock, but excluding land, dwellings, and rental housing) is fully deductible. We use FCRS data to derive the percentage of expenditures from proprietors able to fully deduct. This percentage is used as a proxy for β_2, and β_1 is equal to $1-\beta_2$, since what is not deducted is depreciated. While some cost-share programs do exist, they are collectively insignificant, so we set $\beta_3=0$. Distribution of farm capital across BTP, statutory tax rates, and the computer program used to compute ownership costs of capital and METR are presented in appendix tables.

Results and Discussion

At the regional level, our estimates of the overall marginal effective tax rate (METR) show a surprisingly wide variability. We find that METR's on farm capital go as high as 43.2 percent in the Lake region and as low as 28.1 percent in the Delta region (table 1). Thus, the average investor considering a $1

investment in farm capital in the Lake region will realize a 21-percent lower net return on capital investment than an average investor in the Delta region. Other regional METR results are widely dispersed between these extremes. The differences are a function of several factors, including State marginal tax rates, capital portfolios, corporate/noncorporate ownership, and source of financing.

Tables 1 to 3 summarize our empirical results for the fixed-s scenario under three inflation expectation assumptions (fig. 2). The METR is presented for 154 levels of aggregation while the ownership cost of capital is presented for 88 levels of aggregation. Inflation assumptions are, 0, 3.67, and 10 percent. Our proxy for expected inflation in 1992 is 3.67 percent, based on Feldstein's rule of thumb that inflationary expectations can be approximated as the average of inflation over the previous 12 quarters. We use the implicit GDP-deflator to measure inflation.

Table 1 also shows an even greater disparity between METR for different forms of capital. The U.S. overall average METR for autos is 55.0 percent, while for single-purpose buildings it is 24.7 percent. This disparity reflects the differences between the economic life of an asset and the allowable tax life (fig. 3). While buildings are allowed to be fully depreciated within a range of 10 to 27.5 years, their productive lives are in most cases considerably longer. Thus, the depreciation allowance for structures is relatively generous. The tax life for trucks and autos is 5 years, which is not much different from their productive lives. Capital depreciation is expensed on a historic cost basis, so the value of the tax deduction will decline with inflation (this topic will be explored more below).

The metro/nonmetro breakdown does not represent any special State or Federal provisions for capital located in these two categories. It is rather a function of which types of farm operations tend to locate in the two areas. The farm sector is largely rural and noncorporate, so this comparison, and that for corporate/noncorporate METR, does not carry much economywide significance. The corporate/non-corporate comparison, while insignificant due to the smallness of the U.S. corporate farm sector, does depict the consequence of the large statutory variability in income tax rates across regions and ownership category, as well as the importance of corporate and non-corporate portfolios. It also reflects the higher income brackets of corporate farms, which leads to higher marginal statutory tax rates.

The source of finance represents an interesting contrast in tax treatment. The tax incidence on debt-financed investments is 4 points lower than equity-financed investments overall. The most prominent reason for this is the tax deduction afforded to interest payments on debt. This allowance leads to an opportunity cost (equation 10) that is lower than for a purchase through equity, since the net of tax opportunity cost on equity financing is based on netting out the marginal statutory rate of income tax on interest income (equation 11), which we find to be uniformly lower than the rate for income from capital (app. table 2). Other things being equal, with a lower required net rate of return on purchases of capital with debt, the debt-financed investor places a higher value on identical future depreciation allowances since they are a larger share of future net returns for the debt financier than for the equity financier. This is true even though both debt and equity financing yield an identical pre-tax rate of return equal to r.

Perhaps the most revealing comparison of METR's across ownership categories is their relative sensitivity to alternative inflation assumptions (tables 1 - 3). This shows how inflation can have real consequences to an economic trend, and have different effects across regions, forms of capital, etc. All regions show significant increases in METR as inflation increases, but regional trends for the METR at increasing levels of inflation are not uniform. As our inflation assumption changes from 0 to 10 percent, METR in the Appalachian (+19 percent), Delta (+18 percent), and Northern Plains (+20 percent) States

increase at faster rates than others, such as the Southeast (+13 percent) and Northeastern (+12 percent) States. The economic explanation for this non-uniform sensitivity is that inflation diminishes the importance of depreciation deductions, and regional sensitivity to changes in expected inflation can show significant variation. These deductions play a major role in business cash flow, so if an investor's long-term expectations about inflation are affected, so too is the present expected value of future cash flow. A less evident factor is that short-lived assets require higher annual maintenance costs than long-lived assets, and these annual costs increase with inflation. Thus, the tax write-offs and benefits of ownership diminish with inflation, so regional economic performance is affected by inflation in both absolute terms and relative to other production regions.

Estimated ownership costs for capital parallel results for the METR (tables 1-3). Several reversals of ordering in regional ownership costs occur as inflation assumptions change. In fact, only two of ten regions maintain their order, regarding the level of ownership costs, at all three levels of inflation. This is another example of the differential effects from inflation, and is directly attributed to the differential tax allowances of alternative capital portfolios.

One way to combine the information embedded in our measurement of ownership cost and marginal effective tax rate is to consider the ratio, METR/$(1-A)$. Since we know that the present value of net income from a marginal unit of capital in each region is equal to $1-A$, and the present value of the lifetime tax burden on that capital is proportional to the METR,[10] it is useful to consider the tax burden per unit of lifetime net income. As expected, the lifetime tax burden as a percentage of lifetime net income increases with expected inflation, but not at a uniform rate (table 4). At the very least, these results affect the relative profit margins of regional industries, and may be a catalyst for structural change in regional capital markets.

Regional METR Based on Fixed-r Assumption

Opportunities for tax arbitrage are limited, so we would not expect the METR reported in tables 1 to 3 to converge over time. But we do expect that individual investors will adjust their capital portfolios until the expected real pre-tax rates of return (r) on alternative investments are equal. Further, investors compete for a limited flow of investment funds, so this expected real pre-tax rate of return that all investors have an opportunity to obtain should eventually become equal across all investors (those with favorable tax treatment securing a larger share of new investment funds). We can use the fixed-r methodology to determine what implications an eventual convergence of real rates of return to capital have on the distribution of the METR to different forms of capital. In this scenario, our measure for s represents the marginal yield on real investment that would be required by an investor, given an alternative pre-tax return of r is available. The tax system will produce many different levels of s in this scenario, and yet investors have no opportunity to increase their net return through portfolio adjustments. Consequently, the social return on alternative BTP's is not uniform. From a social standpoint, private savings are not being efficiently allocated to their most productive investment opportunities.

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[10]In the fixed-s scenario, the lifetime tax base (B) of the METR in each BTP is identical, and so the tax burden is METR×B. Since we do not know the value for B, the ratio METR/$(1-A)$ is reported, and represents an index of the tax burden per dollar of net income.

Alternative real rates of return (4, 6, and 8 percent) are assumed across all assets and indicate regional disparity (table 5) similar to the fixed-s outcome. Cardinal comparisons of METR to those from the fixed-s results are not informative, but it is worth noting ordinal differences by region. Particularly, several regions-- such as the Appalachian and Corn Belt States-- fell below other regions in relative tax burdens on capital (compared with the fixed-s approach at π=.0367) under the fixed-r (r=.04) assumption. This result would imply that the ability to adjust capital in response to economic conditions in capital markets benefits some regions more than other regions.

The sensitivity of the METR and ownership costs to assumptions for r can be understood through a partition of income from capital into real income and an inflation premium (income that offsets inflation in the price of inputs and consumption goods plus maintenance income). While the intended tax base of income from capital is only real income, statutory tax rates apply to both real and inflation-premium income. Higher inflationary pressures increase the tax incidence by raising the share of income tax that applies to the unintended target of the tax system--the inflation premium and maintenance income. And increasing r, the real rate of return on investment, reduces the rate of tax incidence due to the diminished share of inflation premium and maintenance income subject to taxation. This result presents a link between conditions for using capital in production and policies of the Federal Reserve. Any announced change in the Central Bank loan rate to commercial banks will affect the METR and the cost of ownership (as can be inferred from table 5).[11] Although the effect is nearly uniform across regions, as r changes from 4 percent to 8 percent, the lifetime tax burden declines by 33 percent (14.3 points) in the Corn Belt region and by 31 percent (14.9 points) in the Pacific States. This implies that the Corn Belt stands to gain more (in our fixed-factor model) from a higher competitive real rate of return to capital, due to a larger reduction in tax burden than in other regions, particularly the Pacific States.

A Sensitivity Analysis

Most of the capital stock data are from primary data sources, but several data points are imputed using incomplete information. Further, the assumption that the value of capital stock at a point in time represents equilibrium in capital portfolios ignores the possibility that a structural change in the composition of capital in production may be underway. To test the sensitivity of our estimated regional METR to our data assumptions, we conduct a Monte Carlo experiment. For each BTP capital stock estimate, we draw 100 random samples with a uniform distribution, bounded by +/- 20 percent of our point estimates. For each regional METR, we calculate the range and median value of 100 random samples, and summarize the results for comparison to regional METR point estimates reported in table 1.

The results of the Monte Carlo experiment are summarized in table 6. The median of the 100 random samples differ by not more than 0.1 points from results reported in table 1. Further, the range of the 100 random draws are between 1.2 and 2.2 points in the 10 regions, with no range exceeding 6.7 percent of the point estimate. These results appear to diminish the significance of a possible bias in our results due to our capital stock data imputation methods and portfolio equilibrium assumption.

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[11]The Federal Reserve loan rate is not the same as the r in our model; however, they are highly correlated, and investors will base their expectations about r on announced Federal funds rate and money supply policy.

Conclusions

Our case study has demonstrated that some owners of capital bear larger cost and tax burdens than others, and that the relative burden to different portfolios show some predictable patterns. Farm proprietors in the Lake and Northeastern States, for example, are likely subject to as much as 15 cents more in tax labilities than in the Appalachian and Delta States on each dollar of income from new capital. If we revise our assumptions about investor expectations regarding inflation, the disparity in tax incidence across regions and asset types change. Higher expected rates of inflation diminish the disparity, while lower expected inflation rates increase the disparity. Increasing the average net real rate of return to capital diminishes the tax incidence on income from capital. Further, different tax rules, whether among States or pertaining to corporate verses noncorporate production, create a disparity in tax incidence between different capital portfolios under any of the assumptions.

Expected income from new investment in farm capital, or more generally all business capital, at the margin will be subject to a wide range of tax burdens, depending on several characteristics of each investor's basic taxable portfolio. Whether this nonuniform treatment of income from capital has any real effect on the flow of investment funds across the many regional industries of the aggregate economy is an empirical issue. Factors important to this issue include the extent of response from employers and suppliers (e.g., savers and financial intermediaries) of capital to changing conditions in their specific markets, and the mobility of capital in factor markets for adjusting composition of capital portfolios. At the very least, the nonuniform treatment of income from capital in taxation does affect relative profit margins and economic performance across regional industries. An economic model of U.S. regional capital markets in two-digit industries that endogenizes the ownership costs and METR for capital would provide important information about the implications of these issues. Similar applications at the national level have produced illuminating findings, and a subnational analysis with explicit treatment of a rural economic sector would be a valuable tool for policymakers and analysts interested in rural economic development.

Application of this methodology is transparent, and so a broader analysis of rural industry would follow the same empirical approach. It is difficult, a priori, to know the outcome of a rural industrywide analysis of conditions for the use of capital in production. But we have discussed several facts about rural industry that would indicate the existence of a distinct rural capital portfolio. In particular, the predominance of land as a factor of production in rural industry, the relative importance of resources in rural industry, and the agglomeration economies of urban industry all strongly imply the partitioning of capital stock into distinct rural and urban portfolios. The significance of this distinction depends on the extent that conditions for the use of rural capital differ from those for urban portfolio. Economic trends over the past three decades in rural industry coincide with the effects of inflation on land-intensive capital portfolios. Such portfolios prosper during inflationary periods, as in the 1970's, and suffer when inflationary pressures subside, as in the 1980's. The surge of inflation at the end of the 1980's preceded the turnaround in the rural economy of the early 1990's.

Future research should focus on the integration of social and demographic accounting procedures for the partition of capital market data into rural and urban sectors, with evaluation of conditions for the use of capital in rural industries. This approach can distinguish between industry classifications, such as services versus manufacturing, and also be partitioned into geographic regions.

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Table1--Marginal effective tax rates and ownership costs by region, fixed-s inflation=3.67%

Item	Appalachian	Corn Belt	Delta	Lake	Mountain	Northeast	N. Plains	Pacific	S. Plains	Southeast	U.S.
						METR (percent)					
Asset											
Auto	49.8	51.8	46.7	63.4	56.1	61.4	50.8	63.9	49.0	62.2	55.0
Buildings	27.2	29.3	26.3	39.5	29.9	33.2	29.4	32.1	27.2	28.5	30.8
Rental dwelling	24.3	27.2	23.2	37.3	26.8	30.1	27.4	28.9	24.3	25.6	28.0
Machinery	34.0	36.6	30.1	45.8	38.9	46.0	35.2	44.8	32.9	45.7	38.7
Tractors	30.5	33.4	26.3	42.6	35.4	43.2	31.8	41.2	29.3	43.0	35.4
Single-purpose bldgs.	20.1	22.5	19.7	34.1	24.2	26.6	24.1	26.7	21.5	21.7	24.7
Trucks	43.2	45.6	39.9	56.2	49.1	55.2	44.4	56.1	42.4	55.6	48.3
Location											
Metro	29.8	33.4	26.7	45.7	36.7	39.0	33.3	38.7	30.4	37.6	36.5
Nonmetro	29.8	33.6	28.5	42.0	33.8	38.2	33.2	37.8	30.7	36.9	34.3
Source of finance											
Debt	26.4	29.7	24.0	39.5	31.7	36.1	30.8	34.3	25.9	33.3	31.7
Equity	30.4	34.3	29.2	44.0	34.8	39.1	33.8	39.3	31.4	37.9	35.7
Ownership											
Corporate	37.9	39.4	35.2	49.3	39.9	51.2	44.7	47.2	38.9	48.3	44.6
Noncorporate	29.7	33.5	28.0	43.1	34.3	38.5	33.2	38.1	30.5	36.6	34.9
Overall tax rate	29.8	33.5	28.1	43.2	34.4	38.7	33.2	38.4	30.6	37.2	35.1
						Ownership cost (cents)					
Asset											
Auto	83.9	84.3	84.3	83.3	84.2	83.8	85.6	83.1	85.5	83.4	84.23
Buildings	95.5	95.5	95.5	94.6	95.3	95.3	95.8	94.7	95.7	95.3	95.29
Rental dwelling	92.7	92.6	92.8	91.4	92.4	92.5	93.0	91.6	93.1	92.4	92.43
Machinery	86.8	87.0	87.3	86.6	87.4	86.6	88.4	86.8	88.5	86.2	87.21
Tractors	82.5	82.9	82.8	81.9	82.7	82.5	84.1	81.6	84.1	82.0	82.82
Single-purpose bldgs.	88.9	89.1	89.4	88.8	89.8	88.9	90.7	89.4	90.5	88.9	89.34
Trucks	84.1	84.5	84.5	83.6	84.4	84.0	85.7	83.4	85.7	83.6	84.43
Overall ownership cost	0.88	0.88	0.88	0.87	0.89	0.88	0.89	0.88	0.89	0.88	0.88

Table2--Marginal effective tax rates and ownership costs by region, fixed-s inflation=0%

Item	Appalachian	Corn Belt	Delta	Lake	Mountain	Northeast	N. Plains	Pacific	S. Plains	Southeast	U.S.
						METR (percent)					
Asset											
Auto	42.7	47.9	39.4	58.7	51.5	57.2	46.7	58.8	39.3	57.8	49.8
Buildings	24.8	27.6	24.4	37.7	28.0	31.3	27.8	30.2	24.3	26.7	28.9
Rental dwelling	21.9	24.9	20.9	34.7	24.2	27.6	25.1	26.2	22.1	23.2	25.6
Machinery	32.1	34.8	28.2	38.3	36.7	44.1	30.5	42.5	30.9	44.0	35.7
Tractors	29.0	31.9	24.8	40.9	33.7	41.7	30.2	39.4	27.8	41.5	33.8
Single-purpose bldgs.	18.8	21.3	18.5	32.3	22.7	25.3	22.9	25.1	20.3	20.2	23.3
Trucks	36.1	42.4	36.5	52.5	45.4	51.7	41.0	52.1	39.0	52.2	44.6
Location											
Metro	27.6	31.5	24.8	41.9	34.5	37.1	30.4	36.4	28.3	35.8	34.3
Nonmetro	27.5	31.7	26.5	36.9	31.6	36.2	29.9	35.7	28.6	35.0	31.7
Source of finance											
Debt	25.3	29.1	23.4	36.0	30.7	35.0	28.2	33.5	25.3	33.0	30.3
Equity	27.9	32.2	26.9	39.1	32.4	37.1	30.3	36.8	29.0	35.8	33.0
Ownership											
Corporate	35.6	37.4	33.1	47.2	37.5	48.9	42.5	44.6	36.6	47.4	42.6
Noncorporate	27.5	31.6	26.1	38.5	32.1	36.6	29.8	35.9	28.4	34.7	32.4
Overall tax rate	27.5	31.7	26.2	38.5	32.2	36.8	29.9	36.2	28.5	35.3	32.5
						Ownership cost (cents)					
Asset											
Auto	82.4	83.4	82.7	82.2	83.2	82.8	84.6	81.9	83.4	82.4	83.05
Buildings	93.0	93.5	93.4	92.3	93.2	93.2	93.9	92.5	92.7	93.2	93.08
Rental dwelling	90.3	90.2	90.5	88.4	89.9	89.9	90.6	88.8	90.8	89.9	89.87
Machinery	85.6	85.9	86.2	82.6	86.1	85.4	85.9	85.3	87.3	85.1	85.48
Tractors	81.9	82.3	82.2	81.2	82.0	81.9	83.5	80.8	83.4	81.4	82.16
Single-purpose bldgs.	87.7	87.8	88.1	86.9	88.2	87.5	89.4	87.7	89.2	87.4	87.87
Trucks	82.2	83.5	83.5	82.4	83.4	83.0	84.8	82.2	84.7	82.6	83.34
Overall ownership cost	0.87	0.87	0.87	0.85	0.87	0.87	0.87	0.86	0.88	0.86	0.87

Table3--Marginal effective tax rates and ownership costs by region, fixed-s inflation=10.00%

Item	Appalachian	Corn Belt	Delta	Lake	Mountain	Northeast	N. Plains	Pacific	S. Plains	Southeast	U.S.
						METR (percent)					
Asset											
Auto	55.8	57.6	52.7	70.2	62.9	67.6	56.9	71.3	55.1	68.5	61.3
Buildings	28.7	30.7	27.5	41.0	31.4	34.7	30.7	33.5	28.4	29.9	32.2
Rental dwelling	26.5	29.2	25.2	39.5	29.0	32.4	29.4	31.2	26.3	27.7	30.1
Machinery	36.5	38.9	32.4	48.5	41.7	48.6	37.7	47.7	35.4	48.4	41.2
Tractors	32.8	35.5	28.7	45.1	37.9	45.6	34.1	43.9	31.6	45.3	37.7
Single-purpose bldgs.	24.0	24.9	23.4	35.5	26.6	28.5	26.0	28.3	23.7	24.1	26.9
Trucks	48.0	50.1	44.6	61.7	54.4	60.1	49.2	62.0	47.2	60.5	53.3
Location											
Metro	32.7	35.8	29.6	48.2	39.5	41.4	35.9	41.4	32.9	40.1	39.1
Nonmetro	32.7	36.0	31.2	44.6	36.6	40.7	35.8	40.4	33.3	39.6	36.9
Source of finance											
Debt	27.1	29.9	24.4	39.9	32.4	37.1	31.7	34.5	25.7	33.4	32.1
Equity	33.6	37.2	32.6	47.1	37.9	41.8	36.6	42.6	34.3	41.0	38.7
Ownership											
Corporate	40.5	41.6	37.3	51.8	42.9	53.9	47.1	49.8	41.6	52.3	47.5
Noncorporate	32.6	36.0	30.7	45.7	37.0	41.0	35.7	40.7	33.1	39.1	37.5
Overall tax rate	32.7	36.0	30.9	45.7	37.1	41.1	35.8	41.1	33.2	39.8	37.6
						Ownership cost (cents)					
Asset											
Auto	85.4	85.7	85.8	85.0	85.8	85.3	87.0	84.9	87.0	84.9	85.75
Buildings	97.3	97.4	97.3	96.9	97.2	97.2	97.5	96.9	97.5	97.2	97.23
Rental dwelling	95.1	95.1	95.2	94.4	94.9	95.0	95.3	94.4	95.4	94.9	94.95
Machinery	88.3	88.6	88.9	88.5	89.2	88.3	90.0	88.8	90.1	88.1	88.91
Tractors	83.5	83.9	83.8	83.0	83.8	83.5	85.1	82.8	85.1	83.1	83.84
Single-purpose bldgs.	90.5	90.6	91.1	90.8	91.6	90.5	92.3	91.6	92.2	90.6	91.08
Trucks	85.5	85.9	86.0	85.2	86.0	85.5	87.2	85.2	87.2	85.1	85.94
Overall ownership cost	0.90	0.89	0.90	0.89	0.90	0.90	0.90	0.90	0.91	0.90	0.90

Table 4--Ratio of tax burden to net income for new capital by region, fixed-s

Item	Appalachian	Corn Belt	Delta	Lake	Mountain	Northeast	N. Plains	Pacific	S. Plains	Southeast
					METR (percent)					
Inflation = 0	31.8	36.6	30.2	45.6	37.0	42.4	34.4	41.9	32.5	40.9
Inflation = 3.67	33.8	38.2	32.0	49.4	38.8	43.9	37.4	43.6	34.4	42.4
Inflation = 10.0	36.4	40.2	34.4	51.2	41.1	45.7	39.6	45.6	36.6	44.4

Table 5--Summary of fixed-r simulation, inflation = 3.67%

Item	Appalachian	Corn Belt	Delta	Lake	Mountain	Northeast	N. Plains	Pacific	S. Plains	Southeast
r=.04										
Overall METR (%)	37.1	43.3	32.0	54.3	43.2	51.2	42.3	47.5	36.9	47.8
Ownership cost ($)	0.81	0.82	0.81	0.80	0.81	0.82	0.83	0.80	0.83	0.81
r=.06										
Overall METR (%)	29.0	34.0	25.1	43.6	34.0	40.6	33.1	37.7	29.0	37.8
Ownership cost ($)	0.82	0.82	0.82	0.81	0.82	0.83	0.83	0.81	0.83	0.82
r=.08										
Overall METR (%)	25.0	29.0	21.9	37.4	29.3	34.7	28.3	32.6	25.1	32.4
Ownership cost ($)	0.83	0.83	0.83	0.82	0.83	0.83	0.84	0.82	0.84	0.83

Table 6--Summary of Monte Carlo results 1/

Item	Appalachian	Corn Belt	Delta	Lake	Mountain	Northeast	N. Plains	Pacific	S. Plains	Southeast
					METR, inflation=3.67%					
Median	29.8	33.5	28.2	43.1	34.4	38.7	33.3	38.4	30.6	37.2
Maximum	30.5	34.2	28.9	44.2	35.2	39.7	34.2	39.6	31.8	38.1
Minimum	29.3	32.8	27.4	42.0	33.4	38.0	32.1	37.3	29.7	36.3

1/ Based on 100 random samples bounded by +/- 20-percent of LCD point estimates.

Figure 1--U.S. farm production regions

Figure 2

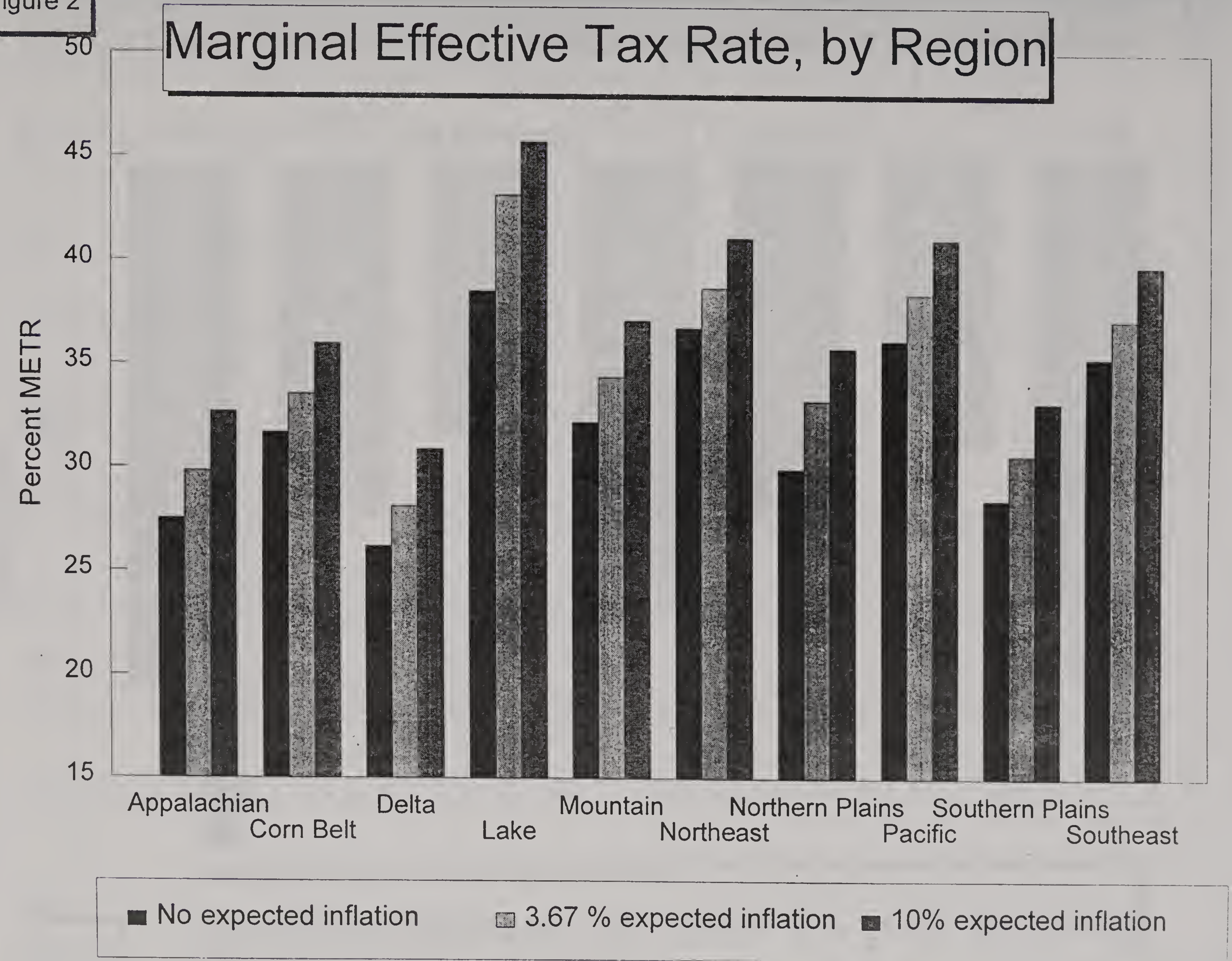
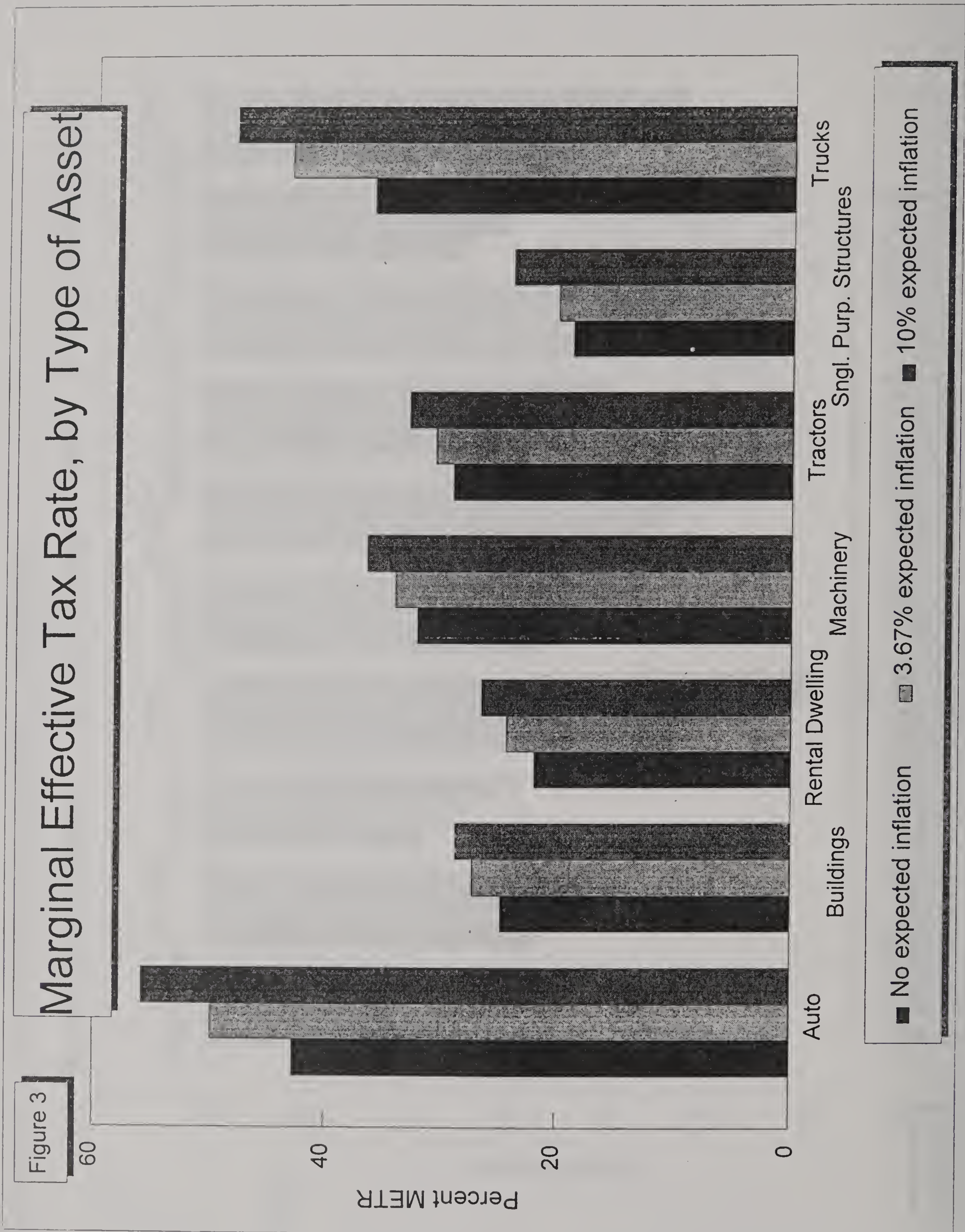

Marginal Effective Tax Rate, by Region
Percent METR
50
45
40
35
30
25
20
15
Appalachian
Corn Belt
Delta
Lake
Mountain
Northeast
Northern Plains
Pacific
Southern Plains
Southeast
No expected inflation
3.67 % expected inflation
10% expected inflation

Figure 3


Marginal Effective Tax Rate, by Type of Asset
Percent METR
0
20
40
60
Auto
Buildings
Rental Dwelling
Machinery
Tractors
Sngl. Purp. Structures
Trucks
No expected inflation
3.67% expected inflation
10% expected inflation

Appendix table 1--Distribution of U.S. farm capital in 1992 1/

Region/ State	Location	financing	Autos non-corp	Autos corp	Buildings non-corp	Buildings corp	Rental Dwellings non-corp	Rental Dwellings corp	Machinery non-corp	Machinery corp	Tractors non-corp	Tractors corp	Sngl. purpose structures non-corp	Sngl. purpose structures corp	Trucks non-corp	Trucks corp
			Percent													
Appalachian																
KY	metro	debt	*	*	0.02	*	0.01	*	0.03	*	0.01	*	0.03	*	0.01	*
	non-metro	debt	*	*	0.04	*	0.02	*	0.13	*	0.03	*	0.08	*	0.02	*
	metro	equity	0.01	*	0.09	*	0.06	*	0.20	*	0.04	*	0.19	*	0.03	*
	non-metro	equity	0.02	*	0.21	*	0.14	*	0.72	*	0.15	*	0.43	*	0.12	*
NC	metro	debt	*	*	0.02	*	0.01	*	0.07	*	0.01	*	0.03	*	0.01	*
	non-metro	debt	*	*	0.02	*	0.01	*	0.10	*	0.02	*	0.04	*	0.02	*
	metro	equity	0.01	*	0.08	*	0.05	*	0.31	*	0.06	*	0.16	*	0.05	*
	non-metro	equity	0.01	*	0.09	*	0.06	*	0.48	0.01	0.10	*	0.19	*	0.08	*
TN	metro	debt	*	*	0.01	*	0.01	*	0.04	*	0.01	*	0.02	*	0.01	*
	non-metro	debt	*	*	0.01	*	0.01	*	0.08	*	0.02	*	0.03	*	0.01	*
	metro	equity	0.01	*	0.06	*	0.05	*	0.26	*	0.05	*	0.12	*	0.04	*
	non-metro	equity	0.02	*	0.10	*	0.08	*	0.54	0.01	0.11	*	0.19	*	0.09	*
VA	metro	debt	*	*	0.02	*	0.01	*	0.04	*	0.01	*	0.04	*	0.01	*
	non-metro	debt	*	*	0.02	*	0.01	*	0.06	*	0.01	*	0.04	*	0.01	*
	metro	equity	0.01	*	0.10	*	0.06	*	0.21	*	0.04	*	0.21	*	0.04	*
	non-metro	equity	0.01	*	0.12	*	0.07	*	0.36	0.01	0.07	*	0.25	*	0.06	*
WV	metro	debt	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	non-metro	debt	*	*	0.01	*	*	*	0.02	*	*	*	0.01	*	*	*
	metro	equity	*	*	0.01	*	*	*	0.03	*	0.01	*	0.02	*	*	*
	non-metro	equity	*	*	0.03	*	0.02	*	0.11	*	0.02	*	0.07	*	0.02	*
Corn Belt																
IA	non-metro	debt	*	*	0.01	*	0.01	*	0.07	*	0.01	*	0.02	*	0.01	*
	metro	debt	0.02	*	0.09	*	0.09	*	0.52	*	0.11	*	0.18	*	0.09	*
	non-metro	equity	0.01	*	0.05	*	0.05	*	0.30	*	0.06	*	0.10	*	0.05	*
	metro	equity	0.07	*	0.38	*	0.40	*	2.30	0.02	0.47	*	0.78	*	0.40	*
IL	non-metro	debt	*	*	0.02	*	0.03	*	0.12	*	0.03	*	0.03	*	0.02	*
	metro	debt	0.01	*	0.03	*	0.06	*	0.26	*	0.05	*	0.06	*	0.05	*
	non-metro	equity	0.02	*	0.09	*	0.21	*	0.73	*	0.15	*	0.19	*	0.13	*
	metro	equity	0.05	*	0.16	*	0.36	*	1.53	0.01	0.31	*	0.33	*	0.27	*
IN	non-metro	debt	*	*	0.02	*	0.03	*	0.11	*	0.02	*	0.05	*	0.02	*
	metro	debt	0.01	*	0.03	*	0.04	*	0.18	*	0.04	*	0.06	*	0.03	*
	non-metro	equity	0.02	*	0.11	*	0.13	*	0.53	*	0.11	*	0.22	*	0.09	*
	metro	equity	0.03	*	0.16	*	0.19	*	0.85	0.01	0.17	*	0.31	*	0.15	*
MO	non-metro	debt	*	*	0.01	*	0.01	*	0.06	*	0.01	*	0.02	*	0.01	*
	metro	debt	0.01	*	0.04	*	0.02	*	0.22	*	0.05	*	0.08	*	0.04	*
	non-metro	equity	0.01	*	0.06	*	0.04	*	0.29	*	0.06	*	0.13	*	0.05	*
	metro	equity	0.03	*	0.20	*	0.11	*	1.13	*	0.23	*	0.41	*	0.20	*
OH	non-metro	debt	*	*	0.02	*	0.01	*	0.09	*	0.02	*	0.04	*	0.02	*
	metro	debt	*	*	0.03	*	0.02	*	0.13	*	0.03	*	0.05	*	0.02	*
	non-metro	equity	0.02	*	0.14	*	0.10	*	0.58	*	0.12	*	0.28	*	0.10	*
	metro	equity	0.03	*	0.17	*	0.12	*	0.86	*	0.18	*	0.36	*	0.15	*
Delta																
AR	metro	debt	*	*	0.01	*	0.01	*	0.04	*	0.01	*	0.02	*	0.01	*
	non-metro	debt	*	*	0.04	*	0.02	*	0.16	*	0.03	*	0.07	*	0.03	*
	metro	equity	*	*	0.04	*	0.02	*	0.14	*	0.03	*	0.07	*	0.03	*

Appendix table 1--Distribution of U.S. farm capital in 1992 1/

			Autos		Buildings		Rental Dwellings		Machinery		Tractors		Sngl. purpose structures		Trucks	
Region/ State	Location	financing	non-corp	corp	non-corp	corp	non-corp	corp	non-corp	corp	non-corp	corp	non-corp	corp	non-corp	corp
								Percent								
	non-metro	equity	0.02	*	0.13	*	0.08	*	0.59	0.01	0.12	*	0.27	*	0.10	*
LA	metro	debt	*	*	0.01	*	*	*	0.03	*	0.01	*	0.01	*	0.01	*
	non-metro	debt	*	*	0.01	*	0.01	*	0.08	*	0.02	*	0.03	*	0.01	*
	metro	equity	*	*	0.02	*	0.02	*	0.13	*	0.03	*	0.05	*	0.02	*
	non-metro	equity	0.01	*	0.05	*	0.04	*	0.32	0.01	0.06	*	0.10	*	0.05	*
MS	metro	debt	*	*	*	*	*	*	0.01	*	*	*	*	*	*	*
	non-metro	debt	*	*	0.02	*	0.01	*	0.12	*	0.02	*	0.04	*	0.02	*
	metro	equity	*	*	0.01	*	*	*	0.04	*	0.01	*	0.01	*	0.01	*
	non-metro	equity	0.01	*	0.07	*	0.04	*	0.45	0.01	0.09	*	0.15	*	0.08	*
Lake																
MI	non-metro	debt	*	*	0.02	*	0.02	*	0.10	*	0.02	*	0.04	*	0.02	*
	metro	debt	*	*	0.02	*	0.02	*	0.10	*	0.02	*	0.04	*	0.02	*
	non-metro	equity	0.02	*	0.11	*	0.09	*	0.51	*	0.10	*	0.22	*	0.09	*
	metro	equity	0.02	*	0.09	*	0.08	*	0.51	*	0.10	*	0.19	*	0.09	*
MN	non-metro	debt	*	*	0.02	*	0.01	*	0.10	*	0.02	*	0.04	*	0.02	*
	metro	debt	0.01	*	0.07	*	0.05	*	0.38	*	0.08	*	0.14	*	0.07	*
	non-metro	equity	0.01	*	0.08	*	0.05	*	0.43	*	0.09	*	0.16	*	0.08	*
	metro	equity	0.05	*	0.29	*	0.19	*	1.61	0.01	0.33	*	0.59	*	0.28	*
WI	non-metro	debt	*	*	0.03	*	0.03	*	0.13	*	0.03	*	0.07	*	0.02	*
	metro	debt	0.01	*	0.07	*	0.05	*	0.29	*	0.06	*	0.13	*	0.05	*
	non-metro	equity	0.02	*	0.14	*	0.11	*	0.53	*	0.11	*	0.28	*	0.09	*
	metro	equity	0.04	*	0.27	*	0.21	*	1.20	0.01	0.24	*	0.54	*	0.21	*
Mountain																
AZ	metro	debt	*	*	*	*	*	*	0.01	*	*	*	0.01	*	*	*
	non-metro	debt	*	*	*	*	*	*	0.01	*	*	*	0.01	*	*	*
	metro	equity	*	*	0.03	*	0.02	*	0.12	*	0.02	*	0.07	*	0.02	*
	non-metro	equity	*	*	0.03	*	0.02	*	0.05	*	0.01	*	0.07	*	0.01	*
CO	metro	debt	*	*	0.01	*	0.01	*	0.03	*	0.01	*	0.01	*	0.01	*
	non-metro	debt	*	*	0.02	*	0.02	*	0.09	*	0.02	*	0.04	*	0.02	*
	metro	equity	*	*	0.03	*	0.04	*	0.16	*	0.03	*	0.07	*	0.03	*
	non-metro	equity	0.01	*	0.09	*	0.11	*	0.41	0.01	0.08	*	0.18	*	0.07	*
ID	metro	debt	*	*	*	*	*	*	0.02	*	*	*	*	*	*	*
	non-metro	debt	*	*	0.02	*	0.03	*	0.13	*	0.03	*	0.04	*	0.02	*
	metro	equity	*	*	0.01	*	0.01	*	0.06	*	0.01	*	0.01	*	0.01	*
	non-metro	equity	0.02	*	0.08	*	0.11	*	0.50	0.01	0.10	*	0.16	*	0.09	*
MT	metro	debt	*	*	*	*	*	*	0.01	*	*	*	*	*	*	*
	non-metro	debt	*	*	0.02	*	0.03	*	0.09	*	0.02	*	0.05	*	0.01	*
	metro	equity	*	*	0.01	*	0.01	*	0.04	*	0.01	*	0.02	*	0.01	*
	non-metro	equity	0.02	*	0.16	*	0.18	*	0.59	0.01	0.12	*	0.32	*	0.10	*
NV	metro	debt	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	non-metro	debt	*	*	*	*	*	*	0.01	*	*	*	0.01	*	*	*
	metro	equity	*	*	0.01	*	*	*	0.01	*	*	*	0.01	*	*	*
	non-metro	equity	*	*	0.03	*	0.02	*	0.06	*	0.01	*	0.06	*	0.01	*
UT	metro	debt	*	*	*	*	*	*	0.01	*	*	*	*	*	*	*
	non-metro	debt	*	*	0.01	*	*	*	0.02	*	*	*	0.01	*	*	*
	metro	equity	*	*	0.01	*	0.01	*	0.05	*	0.01	*	0.02	*	0.01	*

Appendix table 1--Distribution of U.S. farm capital in 1992 1/

			Autos		Buildings		Rental Dwellings		Machinery		Tractors		Sngl. purpose structures		Trucks	
Region/ State	Location	financing	non-corp	corp	non-corp	corp	non-corp	corp	non-corp	corp	non-corp	corp	non-corp	corp	non-corp	corp
									Percent							
	non-metro	equity	0.01	*	0.04	*	0.02	*	0.17	*	0.04	*	0.08	*	0.03	*
WY	metro	debt	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	non-metro	debt	*	*	0.01	*	0.01	*	0.03	*	0.01	*	0.01	*	*	*
	metro	equity	*	*	*	*	0.01	*	0.02	*	*	*	0.01	*	*	*
	non-metro	equity	0.01	*	0.03	*	0.05	*	0.18	*	0.04	*	0.07	*	0.03	*
Northeast																
CT	non-metro	debt	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	metro	debt	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	non-metro	equity	*	*	0.02	*	0.01	*	0.04	*	0.01	*	0.03	*	0.01	*
	metro	equity	*	*	0.01	*	0.01	*	0.02	*	*	*	0.01	*	*	*
DE	non-metro	debt	*	*	*	*	*	*	0.01	*	*	*	0.01	*	*	*
	metro	debt	*	*	*	*	*	*	0.01	*	*	*	0.01	*	*	*
	non-metro	equity	*	*	0.01	*	0.01	*	0.03	*	0.01	*	0.03	*	0.01	*
	metro	equity	*	*	0.01	*	0.01	*	0.04	*	0.01	*	0.03	*	0.01	*
MA	non-metro	debt	*	*	*	*	*	*	0.01	*	*	*	*	*	*	*
	metro	debt	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	non-metro	equity	*	*	0.03	*	0.02	*	0.07	*	0.01	*	0.06	*	0.01	*
	metro	equity	*	*	*	*	*	*	0.01	*	*	*	0.01	*	*	*
MD	non-metro	debt	*	*	0.01	*	0.01	*	0.03	*	0.01	*	0.02	*	*	*
	metro	debt	*	*	*	*	0.01	*	0.02	*	*	*	0.01	*	*	*
	non-metro	equity	*	*	0.06	*	0.06	*	0.16	*	0.03	*	0.12	*	0.03	*
	metro	equity	*	*	0.03	*	0.03	*	0.11	*	0.02	*	0.06	*	0.02	*
ME	non-metro	debt	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	metro	debt	*	*	*	*	*	*	0.01	*	*	*	0.01	*	*	*
	non-metro	equity	*	*	0.01	*	*	*	0.03	*	0.01	*	0.01	*	*	*
	metro	equity	*	*	0.02	*	0.01	*	0.08	*	0.02	*	0.04	*	0.01	*
NH	non-metro	debt	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	metro	debt	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	non-metro	equity	*	*	*	*	*	*	0.01	*	*	*	0.01	*	*	*
	metro	equity	*	*	0.01	*	*	*	0.03	*	0.01	*	0.02	*	*	*
NJ	non-metro	debt	*	*	*	*	*	*	0.01	*	*	*	0.01	*	*	*
	metro	debt	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	non-metro	equity	*	*	0.05	*	0.04	*	0.16	*	0.03	*	0.10	*	0.03	*
	metro	equity	*	*	*	*	*	*	*	*	*	*	*	*	*	*
NY	non-metro	debt	*	*	0.03	*	0.02	*	0.09	*	0.02	*	0.06	*	0.01	*
	metro	debt	*	*	0.02	*	0.01	*	0.06	*	0.01	*	0.04	*	0.01	*
	non-metro	equity	0.01	*	0.14	*	0.09	*	0.43	0.01	0.09	*	0.28	*	0.07	*
	metro	equity	0.01	*	0.09	*	0.06	*	0.31	*	0.06	*	0.18	*	0.05	*
PA	non-metro	debt	*	*	0.02	*	0.02	*	0.08	*	0.02	*	0.07	*	0.01	*
	metro	debt	*	*	*	*	0.01	*	0.06	*	0.01	*	0.03	*	0.01	*
	non-metro	equity	0.02	*	0.21	*	0.13	*	0.54	0.01	0.11	*	0.43	*	0.09	*
	metro	equity	0.01	*	0.10	*	0.07	*	0.37	0.01	0.08	*	0.21	*	0.06	*
RI	non-metro	debt	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	metro	debt	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	non-metro	equity	*	*	*	*	*	*	0.01	*	*	*	0.01	*	*	*

Appendix table 1--Distribution of U.S. farm capital in 1992 1/

Region/ State	Location	financing	Autos non-corp	Autos corp	Buildings non-corp	Buildings corp	Rental Dwellings non-corp	Rental Dwellings corp	Machinery non-corp	Machinery corp	Tractors non-corp	Tractors corp	Sngl. purpose structures non-corp	Sngl. purpose structures corp	Trucks non-corp	Trucks corp
									Percent							
	metro	equity	*	*	*	*	*	*	*	*	*	*	*	*	*	*
VT	non-metro	debt	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	metro	debt	*	*	*	*	*	*	0.01	*	*	*	0.01	*	*	*
	non-metro	equity	*	*	0.01	*	0.01	*	0.03	*	0.01	*	0.01	*	0.01	*
	metro	equity	*	*	0.02	*	0.02	*	0.08	*	0.02	*	0.05	*	0.01	*
Northern Plains																
KS	metro	debt	*	*	*	*	*	*	0.03	*	0.01	*	0.01	*	*	*
	non-metro	debt	0.01	*	0.03	*	0.03	*	0.29	*	0.06	*	0.06	*	0.05	*
	metro	equity	*	*	0.02	*	0.02	*	0.12	*	0.02	*	0.03	*	0.02	*
	non-metro	equity	0.04	*	0.14	*	0.16	*	1.33	0.02	0.27	*	0.29	*	0.23	*
ND	metro	debt	*	*	*	*	*	*	0.02	*	*	*	0.01	*	*	*
	non-metro	debt	0.01	*	0.02	*	0.02	*	0.17	*	0.04	*	0.04	*	0.03	*
	metro	equity	*	*	0.02	*	0.01	*	0.13	*	0.03	*	0.04	*	0.02	*
	non-metro	equity	0.03	*	0.12	*	0.09	*	0.98	*	0.20	*	0.25	*	0.17	*
NE	metro	debt	*	*	*	*	*	*	0.02	*	*	*	0.01	*	*	*
	non-metro	debt	0.01	*	0.05	*	0.05	*	0.31	*	0.06	*	0.10	*	0.05	*
	metro	equity	*	*	0.01	*	0.02	*	0.08	*	0.02	*	0.03	*	0.01	*
	non-metro	equity	0.04	*	0.21	*	0.23	*	1.33	0.02	0.27	*	0.44	*	0.23	*
NM	metro	debt	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	non-metro	debt	*	*	0.01	*	0.01	*	0.02	*	*	*	0.01	*	*	*
	metro	equity	*	*	0.01	*	0.01	*	0.05	*	0.01	*	0.03	*	0.01	*
	non-metro	equity	0.01	*	0.06	*	0.06	*	0.18	*	0.04	*	0.13	*	0.03	*
SD	metro	debt	*	*	*	*	*	*	0.01	*	*	*	0.01	*	*	*
	non-metro	debt	0.01	*	0.04	*	0.02	*	0.17	*	0.03	*	0.07	*	0.03	*
	metro	equity	*	*	0.01	*	0.01	*	0.06	*	0.01	*	0.03	*	0.01	*
	non-metro	equity	0.03	*	0.19	*	0.11	*	0.91	0.01	0.19	*	0.40	*	0.16	*
Pacific																
CA	non-metro	debt	0.01	*	0.10	*	0.08	*	0.32	0.02	0.06	*	0.20	0.01	0.06	*
	metro	debt	*	*	0.02	*	0.02	*	0.06	*	0.01	*	0.04	*	0.01	*
	non-metro	equity	0.04	*	0.42	0.02	0.34	0.01	1.34	0.09	0.27	0.02	0.86	0.03	0.23	0.02
	metro	equity	0.01	*	0.09	*	0.07	*	0.26	0.02	0.05	*	0.18	*	0.05	*
OR	non-metro	debt	*	*	0.01	*	0.01	*	0.05	*	0.01	*	0.02	*	0.01	*
	metro	debt	*	*	0.02	*	0.02	*	0.08	*	0.02	*	0.04	*	0.01	*
	non-metro	equity	0.01	*	0.06	*	0.05	*	0.24	*	0.05	*	0.11	*	0.04	*
	metro	equity	0.01	*	0.10	*	0.09	*	0.37	0.01	0.07	*	0.20	*	0.06	*
WA	non-metro	debt	*	*	0.02	*	0.01	*	0.07	*	0.01	*	0.03	*	0.01	*
	metro	debt	*	*	0.02	*	0.02	*	0.09	*	0.02	*	0.05	*	0.02	*
	non-metro	equity	0.01	*	0.07	*	0.06	*	0.29	0.01	0.06	*	0.14	0.01	0.05	*
	metro	equity	0.01	*	0.10	*	0.08	*	0.42	0.01	0.08	*	0.21	*	0.07	*
Southern Plains																
OK	metro	debt	*	*	0.01	*	0.01	*	0.03	*	0.01	*	0.01	*	0.01	*
	non-metro	debt	*	*	0.02	*	0.02	*	0.14	*	0.03	*	0.04	*	0.02	*
	metro	equity	*	*	0.03	*	0.03	*	0.15	*	0.03	*	0.06	*	0.03	*
	non-metro	equity	0.02	*	0.11	*	0.11	*	0.71	*	0.14	*	0.22	*	0.12	*

Appendix table 1--Distribution of U.S. farm capital in 1992 1/

			Autos		Buildings		Rental Dwellings		Machinery		Tractors		Sngl. purpose structures		Trucks	
Region/ State	Location	financing	non-corp	corp	non-corp	corp	non-corp	corp	non-corp	corp	non-corp	corp	non-corp	corp	non-corp	corp
									Percent							
TX	metro	debt	*	*	0.02	*	0.02	*	0.10	*	0.02	*	0.03	*	0.02	*
	non-metro	debt	0.01	*	0.04	*	0.05	*	0.26	*	0.05	*	0.08	*	0.04	*
	metro	equity	0.02	*	0.11	*	0.15	*	0.67	0.01	0.14	*	0.23	0.01	0.12	*
	non-metro	equity	0.05	*	0.26	*	0.35	*	1.79	0.03	0.37	0.01	0.53	*	0.31	*
Southeast																
AL	non-metro	debt	*	*	0.01	*	*	*	0.03	*	0.01	*	0.02	*	0.01	*
	metro	debt	*	*	0.01	*	0.01	*	0.05	*	0.01	*	0.02	*	0.01	*
	non-metro	equity	0.01	*	0.05	*	0.03	*	0.18	*	0.04	*	0.10	*	0.03	*
	metro	equity	0.01	*	0.07	*	0.04	*	0.29	*	0.06	*	0.14	*	0.05	*
FL	non-metro	debt	*	*	0.02	*	0.01	*	0.06	0.01	0.01	*	0.04	0.01	0.01	*
	metro	debt	*	*	0.01	*	0.01	*	0.03	*	0.01	*	0.02	*	*	*
	non-metro	equity	0.01	*	0.12	0.02	0.06	0.01	0.34	0.05	0.07	0.01	0.25	0.04	0.06	0.01
	metro	equity	*	*	0.07	*	0.04	*	0.16	0.03	0.03	0.01	0.14	*	0.03	*
GA	non-metro	debt	*	*	0.01	*	0.01	*	0.02	*	*	*	0.02	*	*	*
	metro	debt	*	*	0.03	*	0.02	*	0.11	*	0.02	*	0.06	*	0.02	*
	non-metro	equity	*	*	0.04	*	0.02	*	0.09	*	0.02	*	0.08	*	0.02	*
	metro	equity	0.01	*	0.12	*	0.07	*	0.45	0.01	0.09	*	0.24	*	0.08	*
SC	non-metro	debt	*	*	*	*	*	*	0.02	*	*	*	0.01	*	*	*
	metro	debt	*	*	0.01	*	*	*	0.03	*	0.01	*	0.01	*	*	*
	non-metro	equity	*	*	0.03	*	0.02	*	0.11	*	0.02	*	0.05	*	0.02	*
	metro	equity	*	*	0.03	*	0.02	*	0.16	*	0.03	*	0.06	*	0.03	*

1/Due to rounding, cells with values less than 0.005 are reported as"*" and all cell values sum to 99.1 percent.

Appendix table 2--Combined 1992 Federal and State marginal statutory tax rate on income and property, by ownership classification

State	Income from:			Value of:	
	Individual Proprietors	Corporate Proprietors	Interest Earning Accounts	Real Estate 1/	Tangible Property 2/
Appalachian			Percent		
KY	24.0	23.7	20.0	0.31	0.60
NC	24.6	34.5	22.4	0.55	2.10
TN	23.8	30.0	16.3	0.46	1.30
VA	21.1	30.1	22.4	0.52	1.20
WV	22.0	34.5	18.5	0.19	0.70
Cornbelt					
IL	24.5	24.5	19.4	1.01	1.60
IN	22.4	25.6	18.2	0.63	1.90
IA	22.3	31.6	20.1	0.95	1.90
MO	21.5	31.0	19.6	0.38	0.90
OH	23.6	33.0	19.2	0.84	1.80
Delta					
AR	22.4	33.2	20.3	0.38	0.90
LA	21.7	29.8	19.2	0.29	0.30
MS	26.8	30.3	19.6	0.32	0.90
Lake					
MI	24.6	30.2	19.9	3.23	4.30
MN	25.1	33.0	22.9	0.85	1.50
WI	24.8	25.5	20.9	2.15	2.20
Mountain					
AZ	26.9	30.9	20.9	1.94	2.20
CO	22.9	34.6	21.3	0.77	2.40
ID	26.5	29.4	21.8	0.53	1.50
MT	23.9	26.1	21.3	0.66	1.50
NV	22.2	15.0	19.8	0.34	0.90
NM	24.4	28.7	21.2	0.17	0.50
UT	21.4	25.4	21.2	0.39	1.20
WY	19.5	15.0	17.9	0.54	0.70
Northeast					
CT	23.1	37.4	21.4	0.68	1.10
DE	25.2	22.4	22.8	0.10	0.80
ME	27.5	34.5	22.5	1.11	1.60
MD	24.1	36.2	22.5	0.47	1.10
MA	21.3	30.5	22.0	0.77	5.50
NH	19.2	35.4	16.8	1.04	2.60
NJ	24.0	30.8	20.9	0.86	5.10
NY	23.7	29.3	24.2	2.00	3.60
PA	22.0	37.7	18.0	0.98	2.30
RI	25.7	23.5	19.5	1.18	2.40
VT	23.9	19.9	19.3	1.38	0.70

Appendix table 2--Combined 1992 Federal and State marginal statutory tax rate on income and property, by ownership classification

State	Income from:			Value of:	
	Individual Proprietors	Corporate Proprietors	Interest Earning Accounts	Real Estate 1/	Tangible Property 2/
N. plains					
KS	23.8	35.3	21.2	0.46	1.60
NE	22.6	35.4	19.4	1.42	1.40
ND	22.5	19.3	22.2	0.65	1.50
SD	17.3	24.8	14.8	0.99	1.00
Pacific					
CA	27.5	35.7	23.7	0.73	1.80
OR	25.0	32.8	23.3	0.90	2.60
WA	21.4	28.9	17.4	0.71	1.80
Southeast					
AL	23.4	34.8	19.8	0.41	0.80
FL	23.4	33.0	17.7	0.63	1.20
GA	23.6	34.2	22.2	0.16	0.60
SC	24.7	19.3	22.0	0.72	4.10
S. plains					
OK	24.4	34.5	19.9	0.60	3.10
TX	21.4	29.0	17.7	0.45	1.6

1/ Based on tax per $100.00 of market value (USDA, 1994b).

2/ Based on unpublished USDA FCRS data representing the ratio of non-real estate taxes paid per value of tangible capital owned. Tax year 1992 data is used, excluding landlords. Data in Rhode Island and Delaware were insufficient for reliable estimates, so alternative information was used.

Appendix table 3--Computer program to calculate ownership cost and METR for each LCD

```
/*
*-----------------------------------------------------------------------------------------*
|This program is written for use with the SAS statistical software package.  Data on three  |
|average marginal tax rates for each of 48-states, 1992 State and Federal tax rules, economic |
|depreciation rates, and a complement of farm sector economic statistics, are integrated to  |
|determine the ownership cost and marginal effective tax rate (METR) on income from a unit   |
|addition to capital stock for each of 2688 basic taxable portfolio's (BTP)of farm capital   |
|ownership. Calculations are based on a hypothetical one period pre-tax return of $0.1 to each |
|$1 gross investment in capital of any type.  Ownership cost represents the net expenditure on |
|a $1 unit of capital, after accounting for depreciation and deduction allowances over the   |
|assets productive life. The METR measures the percent of lifetime income from each unit of  |
|capital which must be turned over as tax payments to State and Federal government.          |
*-----------------------------------------------------------------------------------------*

*-----------------------------------------------------------------------------------------*
|In this section, assign a 10-percent social rate of return, the appropriate                |
|income tax rate to all LCD, the inflation expectations,depreciation rates from Hulten and   |
|Wykoff, and starting value for roe.                                                          |
|                                                                                             |
|Definitions--s=social rate of return; org_str=C(corporate) or N(non-corporate);             |
|             wtax=property tax; d=exponential rate of decay; itax=income tax rate;          |
|             inf=expected inflation; b=declining balance rate; l=tax life;                  |
|             ls=optimal switching time to straight line depreciation method;                |
|             re_tax=real estate tax rate; prop_tax=property tax rate;P_wtax=personal wealth tax|
|             B1=percent of capital depreciated;  B2=percent of capital expenditures deducted; |
|             wtax=property tax rate;  d=exponential rate of capital decay;                  |
|    type is--D=rental dwelling; R=single purpose structures; S=service structures;          |
|             A=autos; T=trucks;  K=tractors; E=machinery                                    |
*-----------------------------------------------------------------------------------------*
*/
data a;set one.capital;
s=.1;
if org_str="C" then itax=corp_tax;
else itax=ind_tax;
if type="B" or type="D" or type="S" then wtax=re_tax;
else wtax=prop_tax;
p_wtax=0;
inf=.0367;
b=1.5;
roe=.075;
Az=0;
if type="D" or type="R" or type="S" then d=.0237;
else if type="A" then d=.3333;
else if type="T" then d=.2537;
else if type="K" then d=.1633;
else d=.0971;
if type="D" then l=27.5;
else if type="R" then l=10;
else if type="S" then l=20;
else if type="A" or type="T" then l=5;
else if type="K" then l=3;
else l=7;
ls=round(((b-1)/b)*l,.5);
if region=1 then B2=.206;
else if region=2 then B2=.207;
else if region=3 then B2=.170;
else if region=4 then B2=.134;
else if region=5 then B2=.125;
else if region=6 then B2=.198;
else if region=7 then B2=.138;
else if region=8 then B2=.084;
else if region=9 then B2=.129;
else if region=10 then B2=.183;
B1=1-B2;
run;
```

```
/*
*------------------------------------------------------------------------------------------------*
|In this section, compute the present discounted value of depreciation allowances, given        |
|the initial hypothesized value for roe.                                                         |
*------------------------------------------------------------------------------------------------*
*/
data b;set a;
stop=ls-1.5;
do i=0 to stop;
x=((1-(b/l))**(i))*(exp(-(i+.5)*roe)-exp(-(i+1.5)*roe));
Az=Az+x;
x=0;
end;
do i=0 to 1000;
Az=((Az*(1-b/(2*l))*(b/l)+(b/l)*(1-exp(-.5*roe))+(1-(b/(2*l)))*((1-(b/l))**(ls-.5))
*(1/(l-ls))*(exp(-ls*roe)-exp(-l*roe)))*(1/roe))*itax;

/*
*------------------------------------------------------------------------------------------------*
|For rental dwellings, calculate the present value of depreciation using straight line method.  |
*------------------------------------------------------------------------------------------------*
*/
if type="D" then Az=((1-exp(-roe*l))/(roe*l))*itax;
/*
*------------------------------------------------------------------------------------------------*
|Calculate the combined value of tax deductions and lifetime depreciation allowance.  For rental|
|dwellings and service structures, no deductions are allowed, so A=Az.  For each LCD, test the  |
|solution condition.  If condition is not satisfied, change the hypothesized value for roe by   |
|.0001 in the appropriate direction and re-calculate parameters.  When test is satisfied,        |
|advance to "print".                                                                             |
*------------------------------------------------------------------------------------------------*
*/
A=B1*Az + B2*itax;
if type="D" or type="S" then A=Az;
test=round((s+d-wtax)*(1-itax)+inf-d,.0001);
test2=round(roe-A*(roe+d-inf),.0001);
if test=test2 then go to print;
else if test lt test2 then roe=roe-.0001;
else roe=roe+.0001;
Az=0;
stop=ls-1.5;
do j=0 to stop;
x=((1-(b/l))**(i))*(exp(-(i+.5)*roe)-exp(-(i+1.5)*roe));
Az=Az+x;
x=0;
end;
end;
/*
*------------------------------------------------------------------------------------------------*
|Given the solution value for roe, determine the value of the implied interest rate to either   |
|D(debt) or equity (note that int_tax is the marginal tax rate on interest income).             |
|Using this implicit interest rate, measure the p(private) return to capital, and for each of   |
|the 2688 BTP, calculate the tax wedge (s-p), the METR ((s-p)/s), and the ownership cost (1-A). |
|------------------------------------------------------------------------------------------------*
*/
print: if finance="D" then interest=roe/(1-itax);
else interest=roe/(1-int_tax);
p=(1-int_tax)*interest-inf-p_wtax;
w=s-p;
t=w/s;
cost=1-A;
        run;
```